higher lead (V1-V3) positioning, have 100% specificity and over 75% sensitivity for the diagnosis of SUDS or Brugada syndrome. And A) is more sensitive than Proc (95% vs. 

859 Catheter Ablation: Insights from Concomitant Imaging

Tuesday, March 19, 2002, 10:30 a.m.-Noon
Georgia World Congress Center, Room 367W

10:30 a.m.

859-1
Prospective Evaluation of Characteristic Echocardiographic Imaging Signature Associated With Successful Ablation of Inappropriate Sinus Tachycardia


Background: A characteristic intracardiac echocardiographic (IE) signature suggesting transmural/epicardial damage is associated with successful heart rate reduction during anatomically-guided ablation of inappropriate sinus tachycardia (IST). This study is to further evaluate if this may be used as an appropriate endpoint for procedural success.

Methods: Detailed on-line videotape IE (9MHz, 9P) imaging monitoring was performed in 5 pts (all women, age 36±13yrs) with IST. Radiofrequency (RF) ablation was anatomically-based and targeted mainly the superolateral crista terminalis (CT) guided by IE. Lesions were created with 20-50w for up to 2 minutes using an 8-mm tip electrode. Echocardiographically changing towards the epicardium with the development of a complete linear echo-free space (following expansion of wall swelling around the CT and superior vena cava [SVC]) and the ablation number (time) associated with heart rate reduction were carefully assessed during the procedure. Results: Successful heart rate reduction (from 112±54 to 76±18 beats/min) was achieved in all 5 pts and required 38±12(range 28 to 67) RF applications. A transient heart rate reduction started when an incomplete linear (segmental) echo-free space was developed at the anterior CT wall. With further IE guidance, a complete linear echo-free space developed finally covering whole superolateral CT area. This indicated appropriate endpoint when sustained heart rate reduction was observed in all 5 pts (4/5 pts with the p wave in lead III changed from a positive to a flat or negative direction). Craters and thrombus formation were observed within the lesions. No other procedural related complications, such as SVC-RA junction narrowing>50% or pericardial effusion, were identified. No recurrence for symptoms from ablated IST was observed over a follow-up period of 2 to 9 months. Conclusion: A characteristic IE imaging signature associated with the development of a complete echo-free space at CT may provide an appropriate endpoint for procedural success of IST ablation.

10:45 a.m.

859-2
Resolution of Increased Pulmonary Vein Flow Velocity Following Radio Frequency Ablation for Atrial Fibrillation: A Doppler Color Flow Imaging Follow-Up


An increased flow velocity reflects ostial/ulmen narrowing in the ablated pulmonary vein (PV) following catheter ablation for atrial fibrillation (AF). The present study was to characterize the magnitude and time course of flow velocity changes using an AcuNav ultrasound catheter (UC) during repeat procedures targeting the same PV and evaluate the flow velocity response to the repeat ablation. Methods: Out of 174 pts with AF undergoing LA ablation (78 had UC PV flow study) involving at least one PV ostium, 18 (10men, age 53±9yrs) had repeat ablation (up to 3 sessions for up to 2 months after recurrence 8.5±6months followup). The peak velocity (V(cm/sec) of PV ostial flow was measured Pre- and Post-ablation. Results: V was assessed in 2/31 PVs (initial) previously targeted with followup measurement at intervals of 3 days (n=2 PVs), 1 to 3 months (M) (n=4), 1 to 2 M (n=15), and 13 to 30 M (n=5) (Table 1). The mean measured >1000cm/sec Pre-ablation only in 2 pts. One was 110cm/sec at an interval of 3 days vs. 129cm/sec post-initial ablation and the other remained at 137cm/sec after 2.9M followup. There was no significant difference for increased V following repeat ablation at previously targeted PV (n=17 PV; 64±9 Pre- vs. 118±23m/sec Post) as compared to those of previously non-targeted PVs (n=12; 62±12 vs. 125±36). Conclusion: PV ostial flow velocity appears to resolve within months. V of PV flow after repeat ablation of previously targeted PV is comparable to V of non-targeted or PV with initial ablation.

11:00 a.m.

859-3
Acute Changes in Pulmonary Vein Flow Do Not Predict Chronic Pulmonary Vein Stenosis Following Atrial Fibrillation Ablation

Christopher R. Cole, Nasser F. Marrouche, Thomas J. Dressing, Alejandro Perez-Lugonnes, Krijzothy Balaban, Eduardo Saad, Patrick Tchou, Andrea Natalie, Cleveland Clinic Foundation, Cleveland, Ohio.

Background: Electrical isolation of the pulmonary veins with radiofrequency ablation is used for the treatment of atrial fibrillation. A serious potential complication of this procedure is pulmonary vein stenosis. Measurement of the pulmonary vein flow with intracardiac echo pre- and post-ablation has been advocated as a method of predicting which patients will go on to develop chronic pulmonary vein stenosis. However, this hypothesis has never been tested.

Methods: We measured pre- and post-ablation diastolic pulmonary vein flow in each of the 4 pulmonary veins using a phased-array intracardiac echo catheter (Accuson) in 47 patients (age 51±11) undergoing afib ablation. The ostium of each of the pulmonary veins was defined using angiographic and electrical mapping and the intracardiac echo catheter. Electrical isolation all 4 pulmonary veins was achieved using a 4-mm cooled-tip radiofrequency ablation catheter (Cardiac Pathways). Change in pulmonary vein flow, when present, was examined as both an absolute value and as a percentage of the baseline flow. All patients underwent spiral computed tomography (CT) scans of the pulmonary veins 2 months after the procedure. Stenosis was defined as mild (70%).

Regression analysis was used to determine the correlation coefficient (r) between pulmonary vein flow change and chronic vein stenosis.

Conclusions: Acute changes in pulmonary vein flow assessed by intracardiac echo do not appear to be a strong predictor of chronic pulmonary vein stenosis.

11:15 a.m.

859-4
Comprehensive and Detailed Analysis of Pulmonary Veins, Left Atrial Appendage, and Their Interrelations With Gadolinium Enhanced Magnetic Resonance Angiography and 3-D Navigation View Analysis


Background: Atrial fibrillation (AF) can be cured by electrical isolation of the pulmonary veins (PV). Elimination of PV potentials has been proposed as the optimal endpoint for ablation. However, it is often difficult to distinguish PV potentials from far field potentials created by the left atrial appendage (LAA) and other structures. The purpose of this study was to use magnetic resonance angiography (MRA) to evaluate the shared anatomical relationships between the PV and LAA in patients (pts) referred for focal AF ablation.

Methods: Breath hold gadolinium enhanced MRA, using a 1.5 T cardiac MR image (GE), was performed in 15 consecutive patients (pts) who underwent catheter ablation of focal AF at this institution (4 female,51±13 yrs). 3D reconstructed images of the left atrium (LA) and PV were obtained. 3D navigation images were used for the treatment of atrial fibrillation (AF). The r-value between flow and stenosis was only 0.06 (p=ns).

Conclusions: Acute changes in pulmonary vein flow assessed by intracardiac echo do not appear to be a strong predictor of chronic pulmonary vein stenosis.